CLAIMS

What is claimed is:

1. A method of data transfer comprising the steps of:

(a) establishing multiple dynamic wireless linkages between a communications network based on an Internet protocol and a user terminal via a plurality of geo-stationary satellites; and

(b) transferring datagrams conforming to the Internet protocol between the user terminal and the communications network over the multiple wireless linkages.

2. The method of Claim 1 wherein the communications network is the global Internet.

3. The method of Claim 1 wherein the multiple wireless linkages are coupled to the communications network by RF communications base terminals connected to Internet nodes.

4. The method of Claim 1 wherein the datagrams comprise data frames conforming to the Internet protocol.

5. The method of Claim 1 wherein the user terminal assembles datagrams from data frames received as input from the communications network.

6. The method of Claim 1 wherein the user terminal fragments datagrams to generate data frames generated as output to the communications network.

7. A communications system comprising:

a plurality of geo-stationary satellites;

a communications network based on an Internet protocol;

a plurality of Internet nodes coupled to the communications network;

a plurality of communications base terminals coupled to the Internet nodes and to the plurality of geo-stationary satellites; and

a user terminal coupled to the plurality of geo-stationary satellites.

8. The communications system of Claim 7 wherein the user terminal comprises:

a multiple beam antenna for receiving and transmitting signals between the user terminal and the plurality of geo-stationary satellites;

a plurality of amplifiers coupled to the multiple beam antenna;

a plurality of bandpass filters coupled to the plurality of amplifiers;

a modem coupled to the plurality of bandpass filters;

a router & hub coupled to the modem;

a transport layer coupled to the router & hub; and

an estimation processor coupled to the hub & router.

9. The communications system of Claim 8 wherein the estimation processor comprises:

a plurality of relative position vectors;

a user state vector;

a plurality of satellite state vectors; and

at least one estimation algorithm module coupled to the plurality of relative position vectors, the user state vector, and the plurality of satellite state vectors.

10. The communications system of Claim 8 wherein the estimation processor is coupled to an external calibration information module.

11. The communications system of Claim 8 wherein the estimation processor outputs the relative position vectors to the router & hub and to the multiple beam antenna.

12. The communications system of Claim 8 wherein the multiple beam antenna comprises a reflector and a plurality of feedhorns coupled to the reflector.

13. The communications system of Claim 12 wherein the reflector is a parabolic reflector.

14. The communications system of Claim 12 wherein each of the plurality of feedhorns is located on a focal plane of the reflector.

15. The communications system of Claim 12 comprising a tracking mechanism coupled to the multiple beam antenna.

16. The communications system of Claim 15 wherein the tracking mechanism adjusts a position of each of the plurality of feedhorns independently.

17. The communications system of Claim 15 wherein the tracking mechanism adjusts a position of the reflector to optimize overall data throughput.

18. A user terminal comprising:

a multiple beam antenna;

a plurality of amplifiers coupled to the multiple beam antenna;

a plurality of bandpass filters coupled to the plurality of amplifiers;

a modem coupled to the plurality of bandpass filters;

a router & hub coupled to the modem;

a transport layer coupled to the router & hub; and

an estimation processor coupled to the router & hub.

19. The user terminal of Claim 18 wherein the estimation processor comprises:

a plurality of relative position vectors;

a user state vector;

a plurality of satellite state vectors; and

at least one estimation algorithm module coupled to the plurality of relative position vectors, the user

state vector, and the plurality of satellite state vectors.

20. The user terminal of Claim 18 wherein the estimation processor is coupled to an external calibration information module.

21. The user terminal of Claim 18 wherein the estimation processor outputs the relative position vectors to the router & hub and to the multiple beam antenna.

22. The user terminal of Claim 18 wherein the multiple beam antenna comprises a reflector and a plurality of feedhorns coupled to the reflector.

23. The user terminal of Claim 22 wherein the reflector is a parabolic reflector.

24. The user terminal of Claim 22 wherein each of the plurality of feedhorns is located on a focal plane of the reflector.

25. The user terminal of Claim 22 comprising a tracking mechanism coupled to the multiple beam antenna.

26. The user terminal of Claim 25 wherein the tracking mechanism adjusts a position of each of the plurality of feedhorns independently.

state vector, and the plurality of satellite state vectors.

20. The user terminal of Claim 18 wherein the estimation processor is coupled to an external calibration information module.

21. The user terminal of Claim 18 wherein the estimation processor outputs the relative position vectors to the router & hub and to the multiple beam antenna.

22. The user terminal of Claim 18 wherein the multiple beam antenna comprises a reflector and a plurality of feedhorns coupled to the reflector.

23. The user terminal of Claim 22 wherein the reflector is a parabolic reflector.

24. The user terminal of Claim 22 wherein each of the plurality of feedhorns is located on a focal plane of the reflector.

25. The user terminal of Claim 22 comprising a tracking mechanism coupled to the multiple beam antenna.

26. The user terminal of Claim 25 wherein the tracking mechanism adjusts a position of each of the plurality of feedhorns independently.

27. The user terminal of Claim 25 wherein the tracking mechanism adjusts a position of the reflector to optimize overall data throughput.